

Handout: Approach 1 – Using a T-Chart to Find a Pattern

5/23/12

Sum of Consecutive Odd Numbers Problem

What is the sum of the first 10 consecutive odd numbers greater than zero?
Find a way to know the sum of any set of consecutive odd numbers (that start with 1) without adding every number in the set.

$1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19$
 $\swarrow \quad \swarrow \quad \swarrow \quad \swarrow \quad \swarrow$
 $4 \quad 12 \quad 20 \quad 28 \quad 36$
 $\swarrow \quad \swarrow$
 $16 \quad 48$
 $\swarrow \quad \swarrow$
 64
 $\swarrow \quad \swarrow$
 100 ! wow

10 # in a set = 100

1
 1 # in a set = 1

$1 + 3$
 $\swarrow \quad \swarrow$
 4
 2 # in a set = 4

$1 + 3 + 5$
 $\swarrow \quad \swarrow$
 4
 $\swarrow \quad \swarrow$
 9
 3 # in a set = 9

$1 + 3 + 5 + 7$
 $\swarrow \quad \swarrow \quad \swarrow \quad \swarrow$
 $4 \quad 12$
 $\swarrow \quad \swarrow$
 16
 4 # in a set = 16

Rule
 $(\# \text{ in a set})^2 = \text{sum}$
 $S^2 = \text{sum}$

# in a set	sum
1	1
2	4
3	9
4	16
5	25
6	36
7	49
8	64
9	81
10	100

→

$1 + 3 + 5 + 7 + 9$
 $\swarrow \quad \searrow$
 $4 \quad 12$
 $\swarrow \quad \searrow$
 16
 $\swarrow \quad \searrow$
 25
 5 # in a set = 25

$1 + 3 + 5 + 7 + 9 + 11$
 $\swarrow \quad \searrow \quad \swarrow$
 $4 \quad 12 \quad 20$
 $\swarrow \quad \searrow$
 16
 $\swarrow \quad \searrow$
 36
 6 # in a set 36

$1 \quad 3 \quad 5 \quad 7 \quad 9 \quad 11 \quad 13 \quad 15 \quad 17 \quad 19$
 $5 \times 2 \times 10 = 100$

liked how Peter's longer equation
 simplified is just N^2
 also math has so many patterns
 (20, odd/even, etc)

he checked his answer w/ his formula

simple answer (again) just doesn't convince
 people all of the time, math is like
 that ... you might just need to think simply
 instead of in a complicated
 math - formula - variable way

using prior strategies is helpful

& seeing other methods; deeper understanding